

SECTION 305 – MIXED IN-PLACE BASE COURSE

305-1 DESCRIPTION

This item shall consist of a base course composed of existing stabilized gravel base with several seal coats referred to in the CITY OF WATFORD CITY as "hard surfacing," windrowed, mixed in a traveling pugmill-type plant where bituminous material shall be added and reconstructed on the prepared underlying course in accordance with these specifications, and shall conform to the dimensions and typical cross sections shown on the plans and the lines and grades established by the ENGINEER. After a 4-inch depth has been windrowed, the street shall be shaped to section under Section 202 to correct existing crown and make provision for the wearing course material.

305-2 MATERIAL

305-2.1 AGGREGATE. The aggregate material to be added, if any, shall conform to Subsections 304-2.1 and 304-2.2.

305-2.2 BITUMINOUS MATERIAL. The bituminous material shall be SM-K Emulsified Cationic Asphalt. The mixing temperature shall range from 75°F to 130°F. The bitumen content shall be 6 percent of the total weight of the mixed material.

305-3 COMPOSITION OF MIXTURE

The base aggregate shall consist of existing seal coat material and existing stabilized gravel base which shall be sufficiently dried by aerating with motor graders prior to mixing and laydown. Additional stabilized gravel base required for subcut and/or build-up of crown shall conform to Subsection 304-3.

305-4 CONSTRUCTION REQUIREMENTS

305-4.1 WEATHER LIMITATIONS. The base course shall be constructed only when the surface is dry, the atmospheric temperature is above 45°F, and the weather is not foggy or rainy. The temperature requirement may be waived, but only when so directed by the ENGINEER.

305-4.2 EQUIPMENT

(a) General. All methods and equipment, tools, and other plants or machinery used for handling materials and executing any part of the work shall be subject to the approval of the ENGINEER before the work is started. If unsatisfactory, they shall be changed and improved as required.

(b) Traveling Plant Mixer. The traveling pugmill plant shall be self-propelled or tractor-drawn and capable of maintaining a uniform rate of travel while mixing. It shall be mounted on wheels or tread equipment of such type that when loaded to capacity, it will not rut or damage the subgrade or subbase course. The device for picking up the

aggregates from the windrow shall take up the loose material and leave the underlying course clean without damage. Plants equipped for drying the aggregates before adding the bituminous material shall be constructed to allow for no loss of mineral filler or segregation of the aggregate. The equipment for proportioning the aggregate and bituminous material shall accurately measure the specified amounts of material for the mix while the machine is in operation. The plant shall be capable of thoroughly combining the aggregates and bituminous material into a mixture of uniform color with all the particles completely coated, and it shall also be capable of depositing the processed mixture on the subgrade or subbase.

Other machines capable of accomplishing the required results, both in regard to uniform and depth in one pass, will be acceptable under this specification.

Approved methods shall be provided for accurately controlling the correct amount of filler, portland cement, or lime, and for their induction into the mixture at the specified time.

(c) Spreading Equipment. Blade graders for windrowing aggregate and for spreading processed material shall be self-powered.

(d) Rolling Equipment. The rollers shall be an approved type and in good condition as determined by the ENGINEER.

305-4.3 PREPARATION OF UNDERLYING COURSE. Prior to mixing and laydown, a 4-inch depth of existing material shall be windrowed to facilitate excavating and shaping the subgrade to proper section in accordance with Section 202.

305-4.4 MIXING. The aggregate, windrowed and prepared as specified, shall then be mixed with the bituminous material in the traveling mixing plant and then deposited for spreading.

The quantity of bituminous material calibrated for continuous mix shall be determined by the ENGINEER and introduced into the mixer. The mixing shall continue until all particles have been coated and a homogeneous mixture obtained.

Before spreading, the mixture shall be examined by the ENGINEER who shall determine that the mixing is complete and satisfactory. Should the mixture show an excess, deficiency, or uneven distribution of bituminous material, the unsatisfactory condition shall be corrected by the addition of the required aggregate or bituminous material and by remixing. Mixing or spreading shall be done only when authorized by the ENGINEER.

305-4.5 SPREADING AND FINISHING.

(a) General. Spreading shall not be started until the subgrade or subbase has been properly prepared, compacted, and approved by the ENGINEER.

Grade control between the edges of the pavement shall be accomplished by grade stakes or steel grade pins placed in lanes parallel to the centerline of the pavement and at intervals sufficiently close that string lines may be stretched between the stakes or pins.

When practicable, to protect the subgrade and to insure proper drainage, the mixing and spreading shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

(b) Spreading and Blade Finishing. The mixture shall be placed in lanes parallel to the centerline of the pavement and ending each day's run for the full width of the lane.

After the mixing has been completed, the mixed material shall be spread to the required width and depth by a self-powered blade grader, mechanical spreader, or other approved method. In spreading from a windrow, care shall be taken to prevent cutting into the underlying course. If necessary, to prevent such cutting, a layer of the mixture approximately 1/2-inch thick shall be left at the bottom of the windrow. The mixture shall be spread and cured in thin layers. If necessary, the surface shall be continually bladed until a smooth uniform surface, true to line, grade, and cross section has been developed. Should the mixture show an excess, deficiency, or uneven distribution of bituminous material, corrective action shall be taken to alleviate these conditions.

After the base course material has been mixed, spreading shall not be started if threatening weather is apparent. The ENGINEER shall have control of the spreading, aeration, and rolling procedure. The CONTRACTOR shall regulate its operations in a scheduled manner by mixing only such amounts that can be spread, aerated, and compacted within relatively short periods. Those areas which become wet shall be dried and remixed with bituminous material. The remixing, including applications of the bituminous material, shall be handled to insure a thorough and uniform coating of the aggregate. Any wet mixture that remains unsatisfactory after remixing shall be removed.

305-4.6 COMPACTION OF MIXTURE. Aeration after mixing and prior to rolling shall be continued until the mixture is in suitable condition for proper compaction. After each layer has been placed and cured, it shall be thoroughly and uniformly compacted by rollers, as specified. Blading shall continue during the rolling only if so ordered by the ENGINEER.

Initial rolling shall be done longitudinally, overlapping at least 12 inches on successive trips. Alternate trips of power rollers shall be of slightly different lengths. Rolling shall continue until all roller marks are eliminated and until no deflection, rutting, and shoving is noticeable under pneumatic-tired rollers.

The speed of the rollers shall at all times be slow to avoid displacement of the mixture. Any displacement occurring as a result of reversing the direction or the roller or from any other cause shall be corrected at once using rakes and fresh mixture. Sufficient rollers shall be furnished to handle the spreading output and aeration of the mixture.

Places not accessible to the roller shall be thoroughly compacted with tampers. The surface of the mixture after compaction shall be smooth and true to the established crown and grade.

Any mixture which becomes loose and broken, mixed with dirt, or defective in any way prior to acceptance, shall be removed and replaced at the CONTRACTOR's expense with fresh mixture which shall be compacted to conform with the surrounding area. Skin patching shall not be allowed. Any mixture remaining unbonded after rolling shall be removed and replaced.

305-4.7 SURFACE TESTS. The finished surface shall conform to the requirements of Subsection 401-4.13.

305-4.8 THICKNESS. The CONTRACTOR shall remove suitable size samples of the completed base course from locations designated by the ENGINEER to enable him to determine the thickness. When the base deficiency exceeds 1/2 inch, the CONTRACTOR shall correct such areas by scarifying, adding satisfactory base mixture, rolling, reshaping, and finishing in accordance with these specifications. The CONTRACTOR shall replace the base material where borings have been taken for test purposes.

305-4.9 MAINTENANCE. The surface of the base course shall be maintained in its finished condition until any surface course or surface treatment provided in the contract is placed thereon and until the contract is completed and accepted.

305-4.10 BITUMINOUS AND AGGREGATE MATERIAL CONTRACTOR'S RESPONSIBILITY. Samples of the bituminous and aggregate materials that the CONTRACTOR proposes to furnish, together with a statement of their source and character, shall be submitted to the ENGINEER; approval must be obtained before the use of such material begins. The CONTRACTOR shall require the manufacturer or producer of the bituminous and aggregate materials to furnish material subject to this and all other pertinent requirements of the contract. Only those materials that have demonstrated performance under the proposed design requirements will be accepted.

The CONTRACTOR shall furnish vendor's certificate test reports for each tanker, carload, or equivalent of bitumen shipped to the project. The report shall be delivered to the ENGINEER before permission is granted for use of the material. The furnishing of the vendor's certificate test report for the bituminous material shall not be interpreted as a basis for final acceptance. All such test reports shall be subject to verifications by testing samples of materials received for use on the project.

305-5 MEASUREMENT AND PAYMENT

305-5.1 MIXED IN-PLACE BASE COURSE. The Mixed In-Place Base Course shall be measured by the square yard (SY) and paid for at the unit price bid for "Mixed In-Place Base Course" complete, in place, and accepted by the ENGINEER.

305-5.2 BITUMINOUS MATERIAL. The Bituminous Material shall be measured by weighing and this weight converted to gallons at 60°F based on the unit weight shown on the certified analysis report on each car. Payment shall be made at the unit price bid per gallon (GAL) for "Bituminous Material."